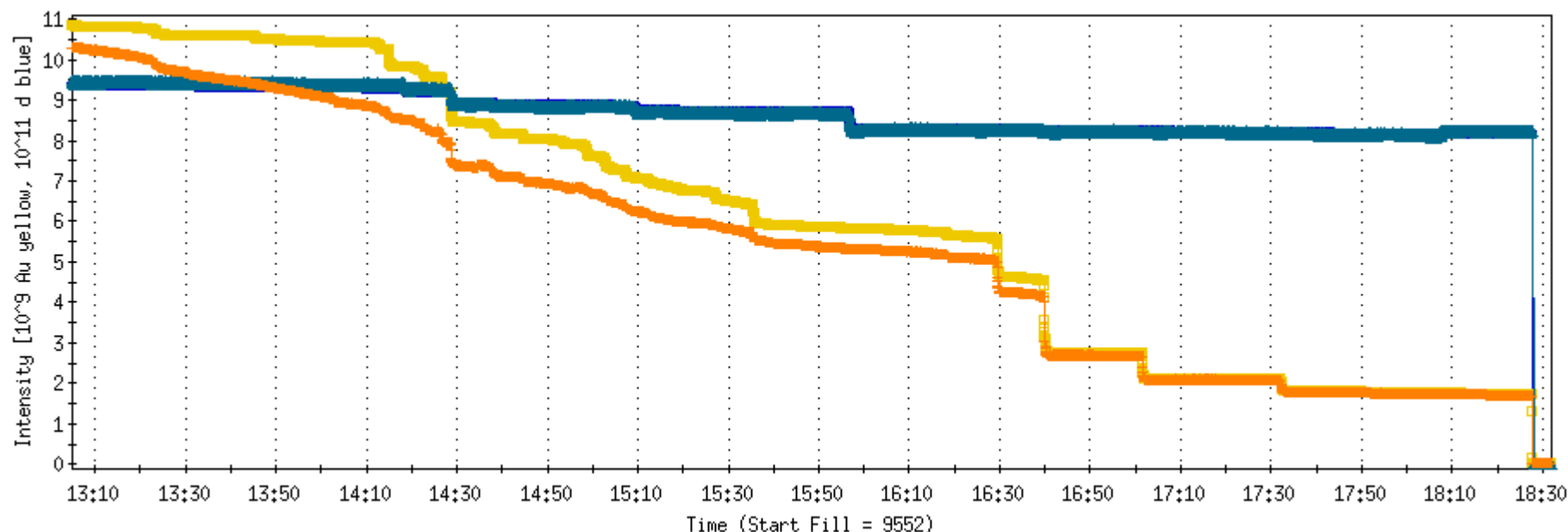
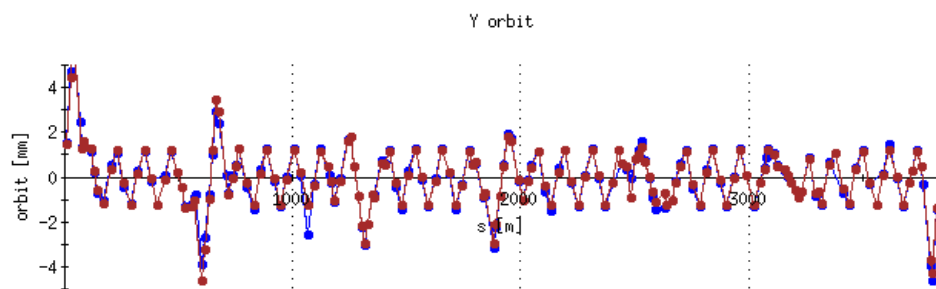
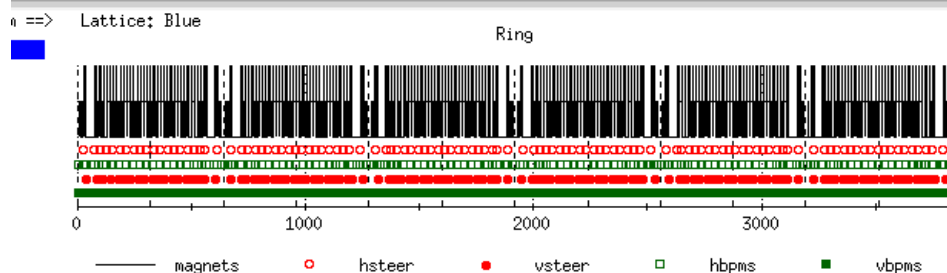
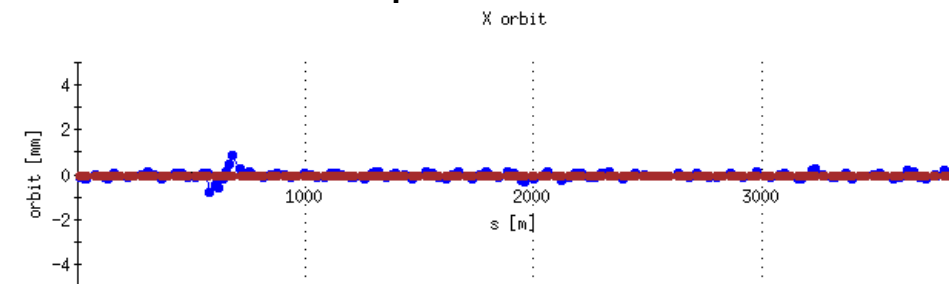


- Goal: Acquire data for ORM analysis of dAu82::store
  - Used leftover beam from IBS store measurement
  - 5 hours of continuous data taking: 13:30-18:30
  - Full data set (horizontal/vertical) acquired in both rings
  - 0.03 mrad individual corrector changes
  - Scraping already shows yellow lattice "more sensitive" than blue



- Several sanity checks performed and data analysis started during data acquisition session



State Control

Region: **Ring** Orbit scale [mm]: **5**

Orbit list:

S	D	Name	Comment	Src	Clr
-	1	No comment		Logged	
-	2	No comment		Logged	
+	3	Difference orbit: We		Differ.	
# +	4	No comment		Model	

1

Turn: 1 Increment: 1

Data Delete Trigger Avg Trigger TBT

Orbit Statistics:

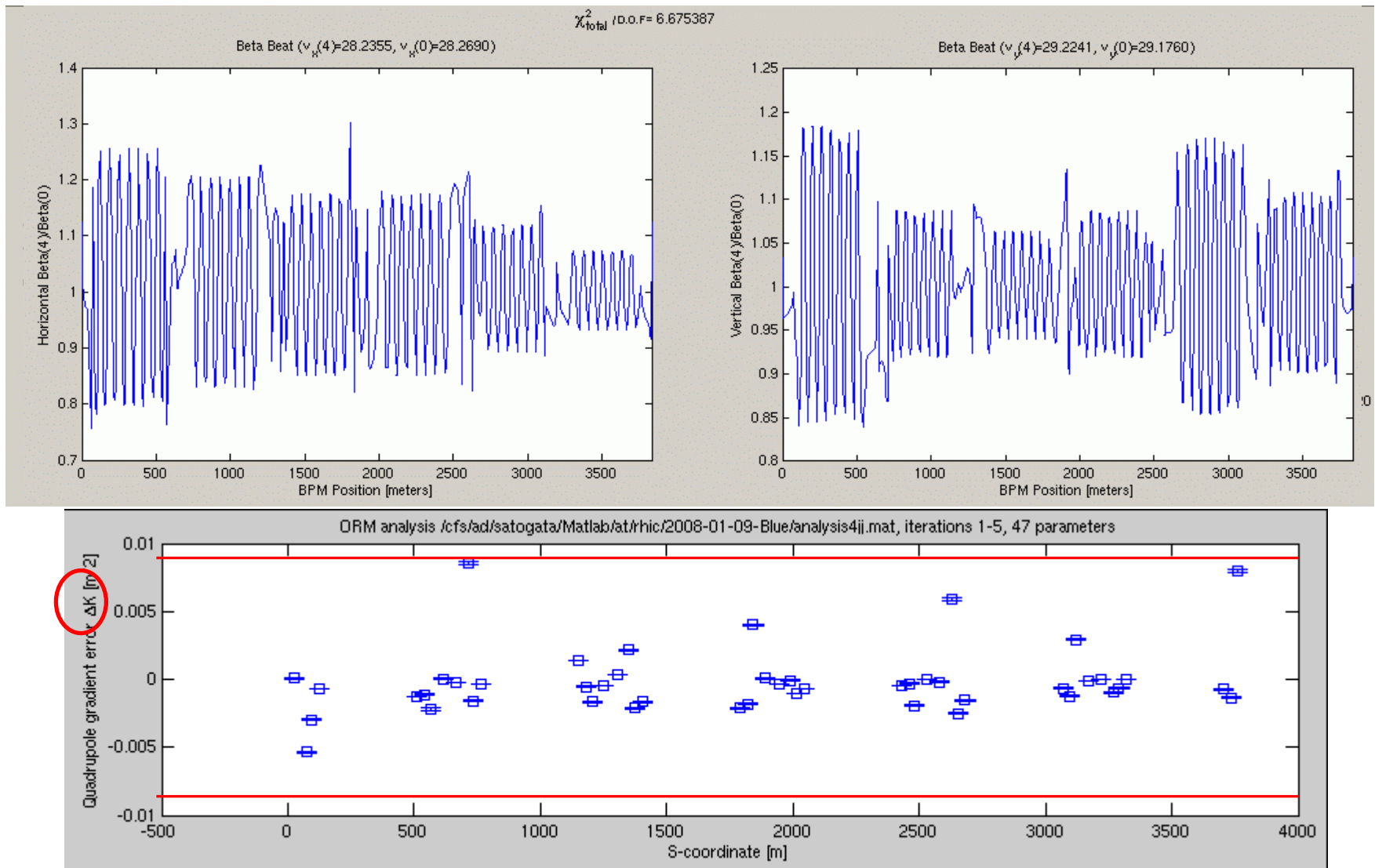
	mean	rms	max	Nbpms
X:	0	0	0	0
Y:	0	0	0	0

Displayed Region  
Arcs

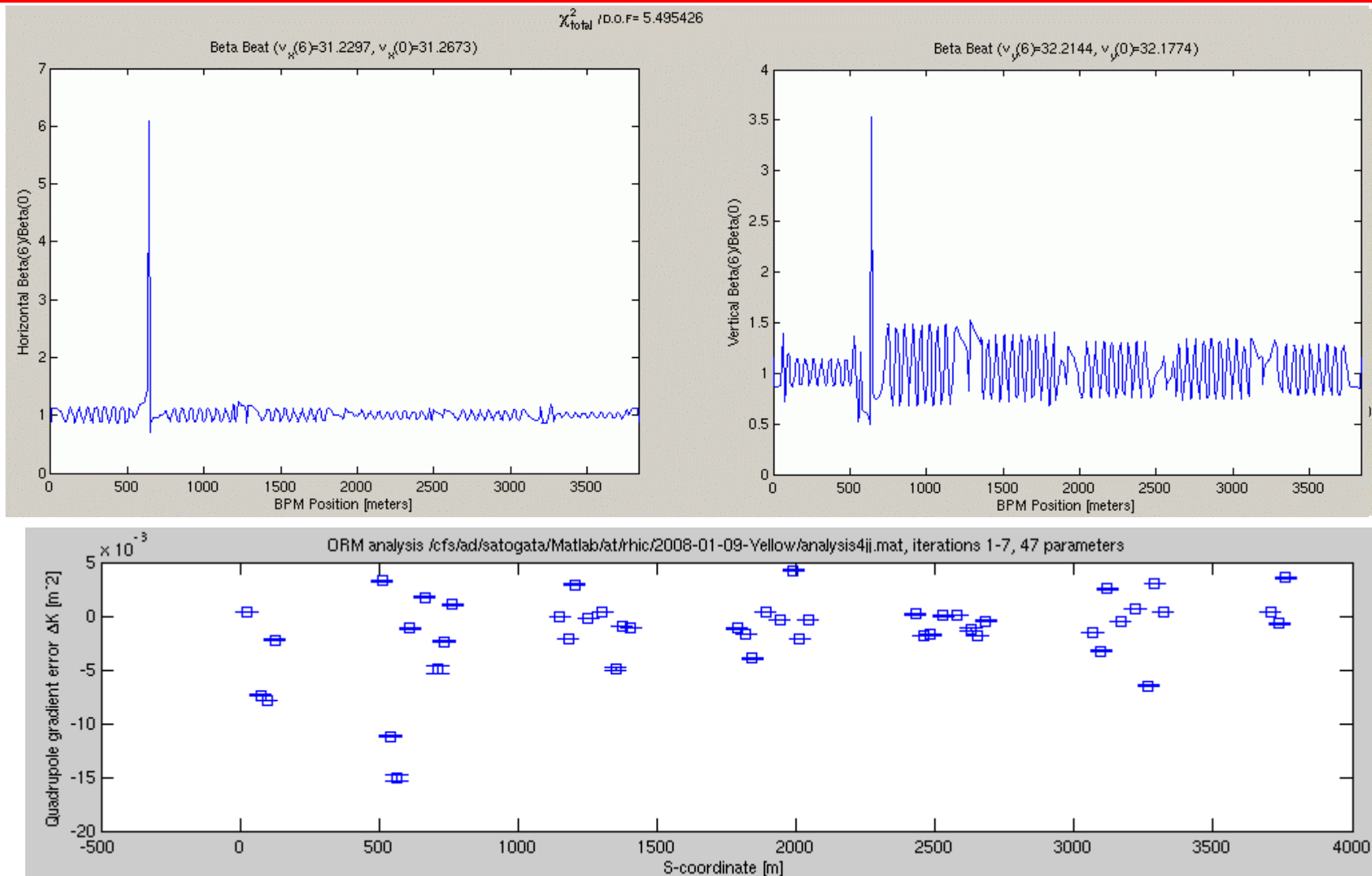
- Analysis performed with Johan Bengtsson Thu Jan 10
  - ORM analysis tends to diverge unless degeneracies are limited
    - ⇒ This leads to inapplicably large correction strengths
  - Originally lumped triplets together, fit Q4-9 separately
  - Best analysis so far fits lumped triplet, Q4,6,8
    - ⇒ This meets ORM preference for both planes of BPMs between quadrupoles used in fit
    - ⇒ All fits reduced  $\chi^2/\text{dof}$  from 700+ to 5-7 within a small number of iterations
  - These fits correct beta-beat by 15-30%
    - ⇒ This analysis does not promise that these are the actual errors in the magnets, but do provide settings to correct beta beating
    - ⇒ No coupling analysis done yet; this is next iteration of effort; therefore little likely improvement in vertical dispersion

Fill	Ring	File	Plane/IR	<u>oddbeta</u>	<u>evenamp</u>	<u>evenbeta</u>	beta* [m]
ORM dAu82	blue		h/8 <u>dx</u>	108.6		101.6	0.66
ORM dAu82	blue		h/6 <u>dx</u>	91.2		92.9	0.75
ORM dAu82	blue		v/8 <u>dx</u>	93.9		90.2	0.75
ORM dAu82	blue		v/6 <u>dx</u>	98.7		89.5	0.74
ORM dAu82	yellow		h/8 <u>dx</u>	144.2		65.1	0.66
ORM dAu82	yellow		h/6 <u>dx</u>	103.6		97.4	0.69
ORM dAu82	yellow		v/8 <u>dx</u>	49.8		89	1
ORM dAu82	yellow		v/6 <u>dx</u>	87		82.2	0.82
					ave <u>bstar</u>	6	0.75
						8	0.77

- Calculated  $\beta^*$ s from fitted DX betas to account for waist
- Blue  $\beta^*$ s are remarkably consistent with 0.75m
- Yellow horizontal seems to compensate yellow vertical  $\beta^*$ s



# ORM APEX Jan 8 2007 Yellow



- Convergence looks very good in both rings
  - This should improve beta beating! Corrections can be applied!
  - Blue much better than yellow, so try blue first
  - Corrections and scripts to apply corrections are ready for testing
- Test on-diagonal correction ASAP
  - Can be verified with AC dipole, difference orbits, other optics
  - Re-measure dispersion with new optics to evaluate
  - Vertical dispersion is likely from quad roll errors and operations near diagonal
- Next iteration should correct off-diagonal terms
  - Preference is to correct coupling with new data set with on-diagonal terms corrected
  - Can be tried with existing data set to test feasibility